

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2018-318-E

In the Matter of)	REBUTTAL TESTIMONY OF
)	KELVIN HENDERSON FOR
Application of Duke Energy Progress, LLC for)	DUKE ENERGY PROGRESS,
Adjustments in Electronic Rate Schedules and)	LLC
Tariffs and Request for an Accounting Order)	

1 **I. INTRODUCTION AND PURPOSE**

2 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
3 **CURRENT POSITION.**

4 A. My name is Kelvin Henderson and my business address is 526 South
5 Church Street, Charlotte, North Carolina. I am Senior Vice President of
6 Nuclear Operations for Duke Energy Corporation (“Duke Energy”), with
7 direct executive accountability for Duke Energy’s North Carolina nuclear
8 stations, including Duke Energy Progress, LLC’s (“DE Progress” or the
9 “Company”) Brunswick Nuclear Station (“Brunswick”) in Brunswick
10 County, North Carolina; the Harris Nuclear Station (“Harris”) in Wake
11 County, North Carolina; and Duke Energy Carolinas, LLC’s (“DE
12 Carolinas”) McGuire Nuclear Station, located in Mecklenburg County,
13 North Carolina.

14 **Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS**
15 **PROCEEDING?**

16 A. Yes, I did.

17 **II. PURPOSE AND SCOPE**

18 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

19 A. My testimony will respond to the direct testimony of ORS witness Willie
20 J. Morgan of the South Carolina Office of Regulatory Staff (the “ORS”)
21 and Nucor Steel (“Nucor”) witness Billie S. LaConte. Specifically, I
22 respond to ORS Witness Morgan and Nucor Witness LaConte’s
23 recommendation to remove the Company’s request to adjust depreciation

1 and amortization expenses to establish a reserve for end of life nuclear
2 costs not captured in its decommissioning studies¹². I also respond to
3 Witness Morgan's recommendation to exclude \$17.83 million of nuclear
4 inventory from rate base.³

5 **III. NUCLEAR RESERVE**

6 **Q. WHAT ARE ORS WITNESS MORGAN AND NUCOR WITNESS**
7 **LACONTE RECOMMENDING AS IT PERTAINS TO THE**
8 **ESTABLISHMENT OF RESERVE FOR END OF LIFE NUCLEAR**
9 **COSTS?**

10 A. Both witness Morgan and witness LaConte recommend that the
11 Commission deny the Company's requested adjustments to establish a
12 reserve fund and collect approximately \$2.9 million annually for end of
13 life nuclear costs, including nuclear fuel and parts inventory, not captured
14 in the Company's decommissioning studies. Both witnesses argue that the
15 requested reserve fund includes estimates for end of life nuclear fuel and
16 parts inventory that are not currently known and measurable. Further,
17 both witnesses opine that is not equitable for the Company's customers to
18 pay for nuclear retirement costs when the date of retirement of the nuclear
19 units is currently uncertain.

¹ Direct Testimony of Willie J. Morgan pp.3-4

² Direct Testimony of Billie S. LaConte pp.3, 25-26

³ Direct Testimony of Willie J. Morgan p.7

1 **Q. DO YOU AGREE WITH THEIR RECOMMENDATION?**

2 A. No, I do not. The establishment of the end of life nuclear reserve is in the
3 best interest of today's customers and the estimates used to determine the
4 level of reserve funding were calculated appropriately.

5 **Q. PLEASE EXPLAIN WHY THE ESTABLISHMENT OF THE**
6 **NUCLEAR RESERVE IS IN THE BEST INTEREST OF TODAY'S**
7 **CUSTOMERS?**

8 A. South Carolina customers have received and will continue to receive the
9 benefits from the strong safety and operational performance of the
10 Company's nuclear fleet. The end of life nuclear fuel and inventory costs
11 not covered in the decommissioning fund represent costs of continued
12 operations of the nuclear fleet. Our customers benefit if those costs are
13 accrued over the remaining life of the nuclear units.

14 **Q. PLEASE EXPLAIN WHY THE ESTIMATES USED TO**
15 **ESTABLISH THE END OF LIFE NUCLEAR RESERVE FUND**
16 **WERE CALCULATED APPROPRIATELY.**

17 A. The reserve fund estimate primarily consists of the remaining fuel in core
18 and inventory used to maintain the units. While both ORS witness
19 Morgan and Nucor witness LaConte are correct that the exact end of life
20 costs are currently not known, the Company used solid principles to
21 estimate the required funds.

1 Regarding nuclear fuel, the Company used current forecasts for
2 uranium, fabrication, and enrichment to calculate the estimated value of
3 underutilized fuel remaining in the last core. Due to the very nature of
4 nuclear power production, fuel cores are carefully designed and balanced
5 to maintain safety margins and production. When a nuclear unit refuels,
6 approximately one third of the fuel is replaced and the remaining fuel is
7 shifted in the core to maintain safe production capability for the next
8 operating cycle. When a unit shuts down at the end of its life,
9 approximately two thirds of the fuel that would otherwise continue to
10 support operation of the next cycle (if the unit were refueled) is left
11 underutilized as a byproduct of cycle operation. Since the last day of
12 operation is known, the projection of underutilized fuel value at the end of
13 the last operating cycle assumes prudent steps will be taken to minimize
14 this underutilization. A shorter last cycle length is assumed and savings
15 from a decreased fuel load are incorporated. Since the last fuel reload will
16 not reside in the core for multiple cycles as would normally be the case,
17 the end of cycle value of the last core is further reduced to account for
18 core design optimization available with the final core load.

19 Regarding nuclear inventory, the Company used the existing
20 inventory balance, at the end of the test period, as the estimate of
21 inventory remaining on the last day of operation. Nuclear plants must be
22 fully maintained for safety purposes until removed from service, and
23 inventory must be available to support that mission. The DE Progress

1 nuclear fleet has demonstrated strong safety and reliability performance
2 providing South Carolina customers with carbon free baseload generation.
3 Ensuring the availability of proper replacement and maintenance
4 components and supplies is vital to continued excellence in operations.

5 **Q. ARE WITNESSES MORGAN AND LACONTE CORRECT IN**
6 **THEIR ASSERTION THAT THE RETIREMENT DATE OF THE**
7 **NUCLEAR UNITS IS UNCERTAIN?**

8 A. ORS witness Morgan and Nucor witness LaConte are correct in their
9 assertion that there is a licensing process, which allows the Company to
10 seek an additional 20 years of service beyond the current license
11 expiration, for the existing nuclear units. The process, known as
12 subsequent license renewal ("SLR") was established by the Nuclear
13 Regulatory Commission. The Company has not yet filed with the NRC,
14 nor received additional license extensions from the NRC, but continues to
15 maintain the existing fleet to ensure that additional license extensions
16 remain a viable option. Until SLR is requested and granted, the current
17 license correctly bounds the end of life of each nuclear unit.

- 1 **Q. ARE WITNESSES MORGAN AND LACONTE CORRECT IN**
2 **INTERPRETTING THE INTEGRATED RESOURCE BASE PLAN**
3 **(“IRP”) AS A DEFINITIVE STATEMENT THAT THE LICENSES**
4 **FOR THE FOUR DE PROGRESS NUCLEAR UNITS WILL BE**
5 **RENEWED?**
- 6 A. No. The IRP is a planning and modeling tool used to establish plans for
7 meeting forecasted annual peak and energy demand, to ensure that
8 adequate capacity is available to meet requirements. The IRP is updated
9 periodically based on current forecasts and planning assumptions.
- 10 **Q. IS THE PROPOSED NUCLEAR RESERVE ACCRUAL PERIOD**
11 **BASED ON THE EXISTING LICENSE EXPIRATION DATE FOR**
12 **EACH UNIT?**
- 13 A. Yes. The proposed nuclear reserve accrual period is based on the existing
14 remaining license period for each of four DE Progress nuclear units.
- 15 **Q. IF LICENSE EXTENSIONS ARE SOUGHT AND GRANTED,**
16 **WOULD THE COMPANY CONSIDER ADJUSTING THE**
17 **ACCRUAL PERIOD?**
- 18 A. Yes. If the Company ultimately applies for and receives a license
19 extension for all or part of the existing DE Progress nuclear fleet, the
20 Company would be open to adjusting the accrual period to reflect
21 shutdown dates based on a renewed license. In fact, as Company witness
22 Bateman⁴ stated in her direct testimony, the annual accrual amount can be

⁴ Direct Testimony of Laura A. Bateman p.18

1 reviewed and adjusted, if needed, in each future general rate case before
2 the end of the plant's life.

3 **IV. NUCLEAR MATERIALS AND SUPPLIES INVENTORY**

4 **Q. WHAT IS ORS WITNESS MORGAN RECOMMENDING AS IT**
5 **PERTAINS TO NUCLEAR MATERIALS AND SUPPLIES**
6 **INVENTORY CATEGORIZED AS ON HOLD?**

7 A. Witness Morgan is recommending that the cost of the nuclear materials
8 and supplies ("M&S") inventory designated in a "hold" state for over four
9 years cannot be used, and therefore, should not be excluded from
10 recovery.⁵ The adjustment recommended by Witness Morgan is a
11 reduction in nuclear inventory of \$17.83 million.

12 **Q. DO YOU AGREE WITH HIS RECOMMENDATION?**

13 A. No. The Company believes nuclear M&S inventory on hold greater than
14 four years is appropriate for recovery because hold items exceeding four
15 years is not indicative that the parts will not be used. In general, nuclear
16 M&S inventory should be kept in a state that will allow it to be utilized
17 when needed. The "hold" process ensures that materials with any
18 discrepancies are properly evaluated prior to use. Materials in a "hold"
19 status do require some actions before they can be released and used.
20 However, it is incorrect to assume that simply because an item is on hold
21 longer than four years that such inventory will not ultimately be used or
22 available for use, when needed. In fact, the inventory can be made

⁵ Direct Testimony of Willie J. Morgan p.7

1 available should priorities dictate applying the maintenance or engineering
2 attention to the cause for the hold.

3 **Q. PLEASE ELABORATE.**

4 A. Depending on the reason, or classification of the hold, there are several
5 factors that can influence the amount of time an item remains on hold.

6 Inventory on Repair Hold falls into two categories: items that can
7 be repaired on-site or at other Company facilities, and items that are sent
8 to external vendors for repair. Repair under both circumstances requires
9 the use of resources, either internal labor, or financial in the case of off-
10 site repairs. Once a specific need is identified and work is forecasted or
11 scheduled, the resources to repair the items are deployed. Items on Repair
12 Hold are stored and maintained in a state to support the eventual repair
13 and reuse of the item. In many cases, the items on Repair Hold are no
14 longer manufactured, and it is more economic to maintain these items on
15 hold and repair when needed versus immediately engineering an approved
16 change. In each case we balance priority and cost in order to maximize
17 safety and reliable operation, which in turn, is beneficial to our customers.

18 Items in the QA Hold classification have received an initial quality
19 assurance inspection at the time of receipt, but the inspection has
20 identified issues or non-conformances that must be resolved prior to
21 releasing the material for its intended purpose. Generally, items on QA
22 Hold for greater than four years indicate that efforts to resolve the
23 deficiency with the vendor have concluded and additional engineering

1 analysis by the Company is required. As with Repair Hold mentioned
2 above, the Company deploys its limited engineering resources to resolve
3 the items on hold status based on overall priorities.

4 Items in an Engineer Change Hold (“EC”) status are held until the
5 engineering review and analysis is completed. The EC classification, as
6 Witness Morgan has defined in his testimony, encompasses items that
7 have been received, but are awaiting the completion of an engineering
8 change before the inventory can be utilized. Many systems and
9 components in a nuclear power plant are governed by detailed design
10 specifications. When a change to existing design is required, detailed
11 engineering evaluation and analysis is required to ensure the change does
12 not adversely impact safety. Often, these design changes are necessitated
13 by obsolescence of material designated in the original design.

14 **Q DO YOU AGREE WITH WITNESS MORGAN’S DESCRIPTION**
15 **OF THE RESOLUTION OF A SIMILAR ISSUE THAT AROSE IN**
16 **THE DEP RATE CASE IN NORTH CAROLINA?**

17 A. Not completely. While Witness Morgan is correct that the North Carolina
18 Utilities Commission (the “NCUC”) accepted an adjustment originally
19 proposed by the North Carolina Public Staff (“NCPS”) witness Dustin
20 Metz to the Company’s nuclear M&S inventory, the approved adjustment
21 was based on a settlement between the Company and the NCPS, which
22 reflected a give-and-take compromise of contested issues to reasonably
23 balance customer interests in mitigating rate impacts with investor

1 interests in providing for reasonable recovery of investments.⁶ Further,
 2 NCPS witness Metz did not recommend the exclusion of the value of
 3 Engineering Change Hold items greater than four years old. Specifically,
 4 he states:

5 Having worked in the nuclear industry and participated in
 6 engineering change packages, I understand that delays may
 7 occur for certain plant projects due to the need to balance
 8 and minimize the overall outage schedule. Thus, I did not
 9 include the costs associated with Engineering Change Hold
 10 category in my adjustment.⁷
 11

12 **Q. DOES THE INVENTORY REDUCTION RECOMMENDED BY**
 13 **WITNESS MORGAN INCLUDE THE EC HOLD CATEGORY?**

14 A. Yes. It appears that the reduction recommended by Witness Morgan
 15 includes items on EC Hold for greater than four years.

16 **Q. PLEASE ELABORATE AND DETAIL THE IMPACT OF EC**
 17 **HOLD ITEMS.**

18 A. At the end of the test year, the DEP nuclear plants had a total of
 19 \$18,947,549 of material on hold for longer than four years. Of that
 20 amount, \$12,637,519 was on EC Hold, held for four or more years.

VI. CONCLUSION

21 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

22 A. Yes, it does.

⁶ *Agreement and Stipulation of Partial Settlement*, NCUC Docket No. E-2, Sub 1142 (November 2017).

⁷ *Testimony of Dustin R. Metz*, NCUC Docket. No. E-2, Sub 1142 (October 2017).